This is "ASC"

Since fall 2016 the Faculty of Engineering at Friedrich-Alexander University Erlangen-Nürnberg (FAU) offers the international Elite Master’s Degree Programme ‘Advanced Signal Processing and Communications Engineering’ (ASC). ASC is a 4-semester M.Sc. within the Elite Network of Bavaria taught in English and designed for holders of outstanding Bachelor’s degrees in Electrical Engineering, Communications Engineering, Computer Science, Applied Mathematics or closely related disciplines. This Elite Master’s programme is characterised in particular by advanced specialist training, intensive individual supervision of outstanding national and international students (‘high potentials’), early introduction of students to international cutting-edge research, an international outlook and the core skills it imparts to participants.

Fields of action
ASC is focusing on concepts for advanced technologies in the areas of signal processing and communications such as: information theory, coding, statistical signal processing, machine learning, pattern recognition, optimization and game theory. Students deepen the broad interdisciplinary scope of these topics choosing from various areas of specialization.

- advanced technologies in the areas of signal processing and communications
- machine learning for image recognition, audio and video
- next-generation wireless systems (mobile and pervasive networks)
- intelligent networks (Smart Grids)
- distributed optimization and computing

ASC and the local Metropolitan Region
According to the Shanghai ranking, FAU Erlangen-Nürnberg is first in Telecommunications Engineering within Germany. The ASC programme is embedded into this stimulating engineering school at FAU and is greatly enriched by the direct involvement of the International Audio Laboratories – a joint research unit of Fraunhofer IIS (‘Home of the mp3’) and the university. With numerous high-profile and world-renowned R&D institutions for audio, multimedia, communications, and medical systems (Siemens, Fraunhofer, Alcatel-Lucent, INTEL, Qualcomm, Continental, Polyester, Medical Valley, a.o.) nearby, theory meets practice on a daily basis, thereby offering many options for complementing studies and for starting an engineering career.

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Study Plan

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In future, society will face significant challenges associated with energy supply and ageing populations while digitisation will continue to progress into all areas of life. Developing a society based on knowledge and innovation is essential to achieving economic competitiveness and sustainable development. Communications and multimedia technology will play a key role in every area of society, particularly for achieving goals of this nature. The purpose of the ASC Elite Master’s programme is to make a decisive contribution towards this objective by providing individualised training to particularly outstanding students.

In the master’s programme, students will be introduced to advanced topics in Digital Communications, Signal Processing, and Information Theory and Coding. The curriculum is designed to prepare students for careers in academia, research, and industry.

In the final semester, students will have the opportunity to engage in a Master’s Thesis project, working closely with a faculty mentor to conduct independent research and contribute to the field.

Intensive and personalized supervision is considered decisive to the success of high-potential students and is therefore an intrinsic part of the degree programme. Each ASC student is assigned an individual mentor from the ASC teaching body as a personal contact partner for the entire duration of the degree programme to ensure potential students and this is therefore an intrinsic part of the degree programme.

Requisities

- Engineering math: linear algebra, complex analysis, linear differential equations, Fourier transform, Laplace transform, z-transform
- Signals and Systems (textbook, e.g., Oppenheim/Willsky, Signals and Systems)
- Communications (textbook, e.g., Haykin, Communication Systems)
- Stochastic Signals (textbook, e.g., Pillai/Papoulis: Probability, Random Variables, and Stochastic Processes)
- Software: MATLAB
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Prerequisites

- Outstanding Bachelor Degree
- Formal admission by the Master’s Office of the University
- 1st or 2nd semester: master’s thesis, degree: master of science
- High average score of Bachelor’s degree: at least 3.0 in German grading system
- M.Sc. Advanced Signal Processing and Communications Engineering: 4 semesters

Programme Information

- Expected BACHELOR Programme
- Electronic Engineering, Communications Engineering, Computer Science, Applied Mathematics, or closely related disciplines.
- Final average score of Bachelor’s degree: at least 80% or 2.0 in German grading system

International Students

- Scholarships: Student jobs for all ASC-students are guaranteed to cover their cost of living, the average income being around €750 monthly.
- Tuition Fees: There is no tuition fee at FAU but every student should pay €114 per semester for student services and a semester ticket. Using the semester ticket, students can use bus transportation in Nuremberg, Erlangen and Fürth on weekends and also during the weeks from 7pm to 6am. They can promote their tickets to full time coverage by paying an extra fee.
- Visa: Before coming to Germany you need to check the visa requirements for your case. For further information see the Visum Information provided by DAAD.
- Residence Permit: If you are interested in complementing your financial resources by working in Germany, a working permit for student jobs or internships is quite easy to obtain.
- Health Insurance: In Germany you will generally need to be covered by health insurance. Several major insurance companies have branch offices in Erlangen.
- Accommodation: Accommodation in Erlangen costs between €250 to €400 monthly per person, depending on the size and type of room or apartment. The FAU accommodation support helps students to find an appropriate accommodation.
- Costs of Living: The minimum monthly cost of living including accommodation and health insurance costs in Erlangen is about €950 to €1000.

Research and Teaching Environment

- When the preparation of the profile of the ASC Elite Master’s programme was undertaken, excellent criteria for research and teaching were defined. ASC is driven by the Institute of Digital Communications, the Chair of Multimodal Communications and Signal Processing, the Chair of Electronics, the Pattern Recognition Lab, the Chair of Computer Networks and Communication Systems, the Chair of Hardware-Software-Co-Design, the Chair of Economic Theory and the Chair of Economics – Discrete Optimization – Mathematics. ASC is also tightly linked to the International Audiolabs Erlangen, a joint research institute of the university and the Fraunhofer IIS.
- All lectures are taught by internationally recognized faculty, including five IEEE Fellows and recipients of numerous other national and international awards.
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Career Prospects

- We aim to ensure programme graduates have an advanced level of personal development, in-depth knowledge of communication and multimedia technology, and to employ well-structured academic working methods and have the core skills that will ensure they can be considered as the ‘brightest minds’ and ‘high potentials’ who merit appointment to executive posts in business and science.
- ASC graduates will advance technological progress as disseminators in leadership positions with managerial responsibility in business and science and contribute sustainably towards societal prosperity.
- The qualification provided by the ASC Elite Master’s programme constitutes an outstanding starting point for acquiring a subsequent doctorate in the shortest possible time.